

WE CLAIM:

1. An improved quick release mechanical bracket for detachably retaining a tank therewithin comprising:
 - A. a frame means extending vertically including;
 - (1) an upper flange means extending outwardly therefrom;
 - (2) a lower flange means extending outwardly therefrom at a position spatially disposed below said upper flange means to define a tank holding zone therebetween;
 - B. a first driveshaft means rotatably mounted within said upper flange means and rotatably mounted within said lower flange means and extending therebetween;
 - C. a second driveshaft means rotatably mounted within said upper flange means at a position laterally spatially disposed from said first driveshaft means, said second driveshaft means being rotatably mounted within said lower flange means at a position spatially disposed laterally from said first driveshaft means, said second driveshaft means extending vertically between said upper flange means and said lower flange means at a position laterally displaced from said first

24 driveshaft means, said second driveshaft means and
25 said first driveshaft means extending vertically
26 approximately parallel with respect to one another
27 to define said tank holding zone therebetween
28 below said upper flange means and above said lower
29 flange means;

30 D. at least one tank clamping means secured to said
31 first driveshaft means and said second driveshaft
32 means and being movable therewith between the
33 closed position retaining a tank within said tank
34 holding zone and an opened position releasing a
35 tank to allow removal thereof from said tank
36 holding zone, each of said tank clamping means
37 including;

38 (1) a first clamping arm means secured to said
39 first driveshaft means to be rotatably
40 movable therewith between a closed position
41 in abutting engagement with a tank positioned
42 within said tank holding zone for retaining
43 same therewithin and the opened position
44 releasing same;

45 (2) a second clamping arm means secured to said
46 second driveshaft means and rotatably movable
47 therewith between a closed position in
48 abutting engagement with a tank positioned
49 within said tank holding zone for retaining

50 same therewithin and the opened position
51 releasing same;

52 E. a first guide boss means fixedly secured to said
53 frame means below said upper flange means and
54 above said lower frame means at a position
55 intermediate therebetween adjacent said first
56 driveshaft means, said first guide boss means
57 defining a first profiled guide surface at least
58 partially encircling said first driveshaft means
59 and positioned thereadjacent to prevent lateral
60 deflection thereof;

61 F. a second guide boss means fixedly secured to said
62 frame means below said upper flange means and
63 above said lower frame means at a position
64 intermediate therebetween adjacent said second
65 driveshaft means, said second guide boss means
66 defining a second profiled guide surface at least
67 partially encircling said second driveshaft means
68 and positioned thereadjacent to prevent lateral
69 deflection thereof; and

70 G. an interengagement means operatively attached with
71 respect to said first driveshaft means and said
72 second driveshaft means for rotating both
73 simultaneously, said interengagement means being
74 operative to rotate said first driveshaft means
75 counterclockwise and said second driveshaft means

76 clockwise simultaneously to move said first
77 clamping means and said second clamping means
78 toward the closed position for retaining of a tank
79 within said tank holding zone, said
80 interengagement means being operative to rotate
81 said first driveshaft means clockwise and said
82 second driveshaft means counterclockwise
83 simultaneously to move said first clamping means
84 and said second clamping means toward the opened
85 position for releasing of a tank from within said
86 tank holding zone.

1 2. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said first profiled guide surface of
4 said first guide boss means is positioned adjacent said
5 first driveshaft means diametrically opposite from said
6 tank holding zone to restrict lateral flexing of said
7 first driveshaft means away from said tank holding zone
8 and wherein said second profiled guide surface of said
9 second guide boss means is positioned adjacent said
10 second driveshaft means diametrically opposite from
11 said tank holding zone to restrict lateral flexing of
12 said second driveshaft means away from said tank
13 holding zone.

1 3. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said first profiled guide surface of
4 said first guide boss means is laterally spaced from
5 said first driveshaft means at a distance of less than
6 0.015 inches and wherein said second profiled guide
7 surface of said second guide boss means is laterally
8 spaced from said second driveshaft means at a distance
9 of less than 0.015 inches.

1 4. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said first profiled guide surface of
4 said first guide boss means is laterally spaced from
5 said first driveshaft means at a distance of between
6 0.005 and 0.010 inches inclusively and wherein said
7 second profiled guide surface of said second guide boss
8 means is laterally spaced from said second driveshaft
9 means at a distance of between 0.005 and 0.010 inches
10 inclusively.

1 5. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said first profiled guide surface is
4 arcuate and wherein said second profiled guide surface
5 is arcuate.

1 6. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said first profiled guide surface of
4 said first guide boss means extends through an arc of
5 greater than 90 degrees and less than 270 degrees to
6 further limit lateral deflecting of said first
7 driveshaft means and wherein said second profiled guide
8 surface of said second guide boss means extends through
9 an arc of greater than 90 degrees and less than 270
10 degrees to further limit lateral deflecting of said
11 second driveshaft means.

1 7. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said first profiled guide surface of
4 said first guide boss means extends through an arc
5 approximately 120 degrees to further limit lateral
6 deflecting of said first driveshaft means and wherein
7 said second profiled guide surface of said second guide
8 boss means extends through an arc of approximately 120
9 degrees to further limit lateral deflecting of said
10 second driveshaft means.

1 8. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in

3 Claim 1 wherein said first profiled guide surface of
4 said first guide boss means includes a first upper
5 guide edge and a first lower guide edge spaced apart
6 from said first upper guide edge to further prevent
7 deflection of said first driveshaft means laterally and
8 wherein said second profiled guide surface of said
9 second guide boss means includes a second upper guide
10 edge and a second lower guide edge spaced apart from
11 said second upper guide edge to further prevent
12 deflection of said second driveshaft means laterally.

- 1 9. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said tank clamping means includes;
4 A. an upper tank clamping member including a first
5 upper clamping arm means and a second upper
6 clamping arm means, said first upper clamping arm
7 means being secured to said first driveshaft means
8 at a position thereon closer to said upper flange
9 means than to said lower flange means and said
10 second upper clamping arm means being secured to
11 said second driveshaft means at a position thereon
12 closer to said upper flange means than to said
13 lower flange means; and
14 B. a lower tank clamping member including a first

15 lower clamping arm means and a second lower
16 clamping arm means, said first lower clamping arm
17 means being secured to said first driveshaft means
18 at a position thereon closer to said lower flange
19 means than to said upper flange means and said
20 second lower clamping arm means being secured to
21 said second driveshaft means at a position thereon
22 closer to said lower flange means than to said
23 upper flange means.

1 10. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 9 wherein said first guide boss means is located
4 at an intermediate position adjacent said first
5 driveshaft means below said first upper clamping arm
6 means and above said first lower clamping arm means to
7 minimize lateral deflection of said first driveshaft
8 means.

1 11. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 9 wherein said second guide boss means is located
4 at an intermediate position adjacent said second
5 driveshaft means below said second upper clamping arm
6 means and above said second lower clamping arm means to
7 minimize lateral deflection of said second driveshaft

8 means.

1 12. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said first driveshaft means is of
4 hexagonal cross-sectional shape defining first flat
5 zones with first protruding corner edges between
6 adjacent of said first flat zones to facilitate keying
7 thereof with respect to said tank clamping means and to
8 facilitate simultaneous rotation thereof between the
9 closed position and opened position and wherein said
10 first profiled guide surface is spaced at approximately
11 0.005 to 0.010 inches from said first protruding corner
12 edges for selective abutment therewith responsive to
13 lateral deflection of said first driveshaft for
14 minimizing thereof.

1 13. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said second driveshaft means is of
4 hexagonal cross-sectional shape defining second flat
5 zones with second protruding corner edges between
6 adjacent of said second flat zones to facilitate keying
7 thereof with respect to said tank clamping means and to
8 facilitate simultaneous rotation thereof between the
9 closed position and opened position and wherein said

second profiled guide surface is spaced at approximately 0.005 to 0.010 inches from said second protruding corner edges for selective abutment therewith responsive to lateral deflection of said second driveshaft for minimizing thereof.

14. An improved quick release mechanical bracket for detachably retaining a tank therewithin as defined in Claim 1 wherein said first driveshaft means and said second driveshaft means are made of steel and wherein said first guide boss means and said second guide boss means are made of cast aluminum to minimize wear of said first driveshaft means and said second driveshaft means responsive to lateral deflection thereof causing abutment thereof with respect to said first guide boss means and said second guide boss means, respectively.

15. An improved quick release mechanical bracket for detachably retaining a tank therewithin as defined in Claim 1 wherein said first guide boss means is positioned adjacent said first driveshaft means at a position halfway between said upper flange means thereabove and said lower flange means therebelow and wherein said second guide boss means is positioned adjacent said second driveshaft means at a position halfway between said upper flange means thereabove and

10 said lower flange means therebelow.

1 16. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said first guide boss means and said
4 second guide boss means are integrally formed with
5 respect to said frame means.

1 17. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin as defined in
3 Claim 1 wherein said frame means includes a securement
4 apparatus for facilitating mounting of said frame means
5 to environmental structure, said securement apparatus
6 including:

7 A. an upper securement means positioned adjacent said
8 upper flange means;

9 B. a lower securement means positioned adjacent said
10 lower flange means; and

11 C. an intermediate securement means positioned
12 immediately adjacent said first guide boss means
13 and said second guide boss means for facilitating
14 maintaining of structural integrity thereof in
15 order to minimize lateral deflecting of said first
16 driveshaft means and said second driveshaft means,
17 respectively.

1 18. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin comprising:
3 A. a frame means extending vertically including;
4 (1) an upper flange means extending outwardly
5 therefrom;
6 (2) a lower flange means extending outwardly
7 therefrom at a position spatially disposed
8 below said upper flange means to define a
9 tank holding zone therebetween;
10 B. a first driveshaft means rotatably mounted within
11 said upper flange means and rotatably mounted
12 within said lower flange means and extending
13 therebetween;
14 C. a second driveshaft means rotatably mounted within
15 said upper flange means at a position laterally
16 spatially disposed from said first driveshaft
17 means, said second driveshaft means being
18 rotatably mounted within said lower flange means
19 at a position spatially disposed laterally from
20 said first driveshaft means, said second
21 driveshaft means extending vertically between said
22 upper flange means and said lower flange means at
23 a position laterally displaced from said first
24 driveshaft means, said second driveshaft means and
25 said first driveshaft means extending vertically
26 approximately parallel with respect to one another

27 to define said tank holding zone therebetween
28 below said upper flange means and above said lower
29 flange means;

30 D. a tank clamping means secured to said first
31 driveshaft means and said second driveshaft means
32 and being movable therewith between the closed
33 position retaining a tank within said tank holding
34 zone and an opened position releasing a tank to
35 allow removal thereof from said tank holding zone,
36 said tank clamping means including;

37 (1) an upper tank clamping member including

38 (a) a first upper clamping arm means;

39 (b) a second upper clamping arm means, said
40 first upper clamping arm means being
41 secured to said first driveshaft means
42 at a position thereon closer to said
43 upper flange means than to said lower
44 flange means and said second upper
45 clamping arm means being secured to said
46 second driveshaft means at a position
47 thereon closer to said upper flange
48 means than to said lower flange means;

49 (2) a lower tank clamping member including;

50 (a) a first lower clamping arm means;

51 (b) a second lower clamping arm means, said
52 first lower clamping arm means being

53 secured to said first driveshaft means
54 at a position thereon closer to said
55 lower flange means than to said upper
56 flange means and said second lower
57 clamping arm means being secured to said
58 second driveshaft means at a position
59 thereon closer to said lower flange
60 means than to said upper flange means;
61 E. a first guide boss means formed integrally with
62 said frame means below said upper flange means and
63 above said lower frame means at a position
64 intermediate therebetween adjacent said first
65 driveshaft means, said first guide boss means
66 defining a first profiled guide surface being
67 arcuate and at least partially encircling said
68 first driveshaft means and positioned
69 thereadjacent to prevent lateral deflection
70 thereof, said first profiled guide surface of said
71 first guide boss means being positioned adjacent
72 said first driveshaft means diametrically opposite
73 from said tank holding zone to restrict lateral
74 flexing of said first driveshaft means away from
75 said tank holding zone, said first profiled guide
76 surface of said first guide boss means being
77 laterally spaced from said first driveshaft means
78 at a distance of less than 0.015 inches, said

79 first profiled guide surface of said first guide
80 boss means extending through an arc of greater
81 than 90 degrees and less than 270 degrees to
82 further limit lateral deflecting of said first
83 driveshaft means, said first guide boss means
84 being positioned adjacent said first driveshaft
85 means at a position halfway between said upper
86 flange means thereabove and said lower flange
87 means therebelow, said first profiled guide
88 surface including:

89 (1) a first upper guide edge;

90 (2) a first lower guide edge spaced apart from
91 said first upper guide edge, said first upper
92 guide edge and said first lower guide edge
93 cooperating to further prevent deflection of
94 said first driveshaft means laterally;

95 F. a second guide boss means formed integrally with
96 said frame means below said upper flange means and
97 above said lower frame means at a position
98 intermediate therebetween adjacent said second
99 driveshaft means, said second guide boss means
100 defining a second profiled guide surface being
101 arcuate and at least partially encircling said
102 second driveshaft means and positioned
103 thereadjacent to prevent lateral deflection
104 thereof, said second profiled guide surface of

said second guide boss means being positioned adjacent said second driveshaft means diametrically opposite from said tank holding zone to restrict lateral flexing of said second driveshaft means away from said tank holding zone, said second profiled guide surface of said second guide boss means being laterally spaced from said second driveshaft means at a distance of less than 0.015, said second profiled guide surface of said second guide boss means extending through an arc of greater than 90 degrees and less than 270 degrees to further limit lateral deflecting of said second driveshaft means, said second guide boss means being positioned adjacent said second driveshaft means at a position halfway between said upper flange means thereabove and said lower flange means therebelow, said second profiled guide surface of said second guide boss means including:

- (1) a second upper guide edge;
- (2) a second lower guide edge spaced apart from said second upper guide edge, said second lower guide edge and said second upper guide edge cooperating together to further prevent deflection of said second driveshaft means laterally; and

131 G. an interengagement means operatively attached with
132 respect to said first driveshaft means and said
133 second driveshaft means for rotating both
134 simultaneously, said interengagement means being
135 operative to rotate said first driveshaft means
136 counterclockwise and said second driveshaft means
137 clockwise simultaneously to move said first
138 clamping means and said second clamping means
139 toward the closed position for retaining of a tank
140 within said tank holding zone, said
141 interengagement means being operative to rotate
142 said first driveshaft means clockwise and said
143 second driveshaft means counterclockwise
144 simultaneously to move said first clamping means
145 and said second clamping means toward the opened
146 position for releasing of a tank from within said
147 tank holding zone.

- 1 19. An improved quick release mechanical bracket for
2 detachably retaining a tank therewithin comprising:
3 A. a frame means of aluminum extending vertically
4 including;
5 (1) an upper flange means extending outwardly
6 therefrom;
7 (2) a lower flange means extending outwardly
8 therefrom at a position spatially disposed

9 below said upper flange means to define a
10 tank holding zone therebetween;

11 (3) a securement apparatus for facilitating
12 mounting of said frame means to environmental
13 structure, said securement apparatus
14 including:

15 (a) an upper securement means positioned
16 adjacent said upper flange means;

17 (b) a lower securement means positioned
18 adjacent said lower flange means;

19 (c) an intermediate securement means
20 positioned at an intermediate position
21 below said upper securement means and
22 above said lower securement means to
23 facilitate fixed securement of said
24 frame means to environmental structure;

25 B. a first driveshaft means made of steel and
26 rotatably mounted within said upper flange means
27 and rotatably mounted within said lower flange
28 means and extending therebetween;

29 C. a second driveshaft means made of steel and
30 rotatably mounted within said upper flange means
31 at a position laterally spatially disposed from
32 said first driveshaft means, said second
33 driveshaft means being rotatably mounted within
34 said lower flange means at a position spatially

35 disposed laterally from said first driveshaft
36 means, said second driveshaft means extending
37 vertically between said upper flange means and
38 said lower flange means at a position laterally
39 displaced from said first driveshaft means, said
40 second driveshaft means and said first driveshaft
41 means extending vertically approximately parallel
42 with respect to one another to define said tank
43 holding zone therebetween below said upper flange
44 means and above said lower flange means;

45 D. a tank clamping means secured to said first
46 driveshaft means and said second driveshaft means
47 and being movable therewith between the closed
48 position retaining a tank within said tank holding
49 zone and an opened position releasing a tank to
50 allow removal thereof from said tank holding zone,
51 said tank clamping means including;

52 (1) an upper tank clamping member including

53 (a) a first upper clamping arm means;

54 (b) a second upper clamping arm means, said
55 first upper clamping arm means being
56 secured to said first driveshaft means
57 at a position thereon closer to said
58 upper flange means than to said lower
59 flange means and said second upper
60 clamping arm means being secured to said

61 second driveshaft means at a position
62 thereon closer to said upper flange
63 means than to said lower flange means;
64 (2) a lower tank clamping member including;
65 (a) a first lower clamping arm means;
66 (b) a second lower clamping arm means, said
67 first lower clamping arm means being
68 secured to said first driveshaft means
69 at a position thereon closer to said
70 lower flange means than to said upper
71 flange means and said second lower
72 clamping arm means being secured to said
73 second driveshaft means at a position
74 thereon closer to said lower flange
75 means than to said upper flange means;
76 E. a first guide boss means of aluminum and formed
77 integrally with said frame means below said upper
78 flange means and above said lower frame means at a
79 position intermediate therebetween adjacent said
80 first driveshaft means, said first guide boss
81 means positioned immediately adjacent said
82 intermediate securement means in order to
83 facilitate maintaining of structural integrity of
84 said frame means thereadjacent for minimizing
85 lateral deflecting of said first driveshaft mean,
86 said first guide boss means defining a first

87 profiled guide surface being arcuate and at least
88 partially encircling said first driveshaft means
89 and positioned thereadjacent to prevent lateral
90 deflection thereof, said first profiled guide
91 surface of said first guide boss means being
92 positioned adjacent said first driveshaft means
93 diametrically opposite from said tank holding zone
94 to restrict lateral flexing of said first
95 driveshaft means away from said tank holding zone,
96 said first profiled guide surface of said first
97 guide boss means being laterally spaced from said
98 first driveshaft means at a distance of 0.005 to
99 0.010 inches, said first profiled guide surface of
100 said first guide boss means extending through an
101 arc of approximately 120 degrees to further limit
102 lateral deflecting of said first driveshaft means,
103 said first guide boss means being located at an
104 intermediate position adjacent said first
105 driveshaft means below said first upper clamping
106 arm means and above said first lower clamping arm
107 means to minimize lateral deflection of said first
108 driveshaft means, said first guide boss means
109 being positioned adjacent said first driveshaft
110 means at a position halfway between said upper
111 flange means thereabove and said lower flange
112 means therebelow, said first profiled guide

113 surface including:
114 (1) a first upper guide edge;
115 (2) a first lower guide edge spaced apart from
116 said first upper guide edge, said first upper
117 guide edge and said first lower guide edge
118 cooperating to further prevent deflection of
119 said first driveshaft means laterally;
120 F. a second guide boss means of aluminum and formed
121 integrally with said frame means below said upper
122 flange means and above said lower frame means at a
123 position intermediate therebetween adjacent said
124 second driveshaft means, said second guide boss
125 means positioned immediately adjacent said
126 intermediate securement means in order to
127 facilitate maintaining of structural integrity of
128 said frame means thereadjacent for minimizing
129 lateral deflecting of said second driveshaft
130 means, said second guide boss means defining a
131 second profiled guide surface being arcuate and at
132 least partially encircling said second driveshaft
133 means and positioned thereadjacent to prevent
134 lateral deflection thereof, said second profiled
135 guide surface of said second guide boss means
136 being positioned adjacent said second driveshaft
137 means diametrically opposite from said tank
138 holding zone to restrict lateral flexing of said

139 second driveshaft means away from said tank
140 holding zone, said second profiled guide surface
141 of said second guide boss means being laterally
142 spaced from said second driveshaft means at a
143 distance between 0.005 to 0.010 inches, said
144 second profiled guide surface of said second guide
145 boss means extending through an arc of
146 approximately 120 degrees to further limit lateral
147 deflecting of said second driveshaft means, said
148 second guide boss means being located at an
149 intermediate position adjacent said second
150 driveshaft means below said second upper clamping
151 arm means and above said second lower clamping arm
152 means to minimize lateral deflection of said
153 second driveshaft means, said second guide boss
154 means being positioned adjacent said second
155 driveshaft means at a position halfway between
156 said upper flange means thereabove and said lower
157 flange means therebelow, said second profiled
158 guide surface of said second guide boss means
159 including:
160 (1) a second upper guide edge;
161 (2) a second lower guide edge spaced apart from
162 said second upper guide edge, said second
163 lower guide edge and said second upper guide
164 edge cooperating together to further prevent

165 deflection of said second driveshaft means
166 laterally; and
167 G. an interengagement means operatively attached with
168 respect to said first driveshaft means and said
169 second driveshaft means for rotating both
170 simultaneously, said interengagement means being
171 operative to rotate said first driveshaft means
172 counterclockwise and said second driveshaft means
173 clockwise simultaneously to move said first
174 clamping means and said second clamping means
175 toward the closed position for retaining of a tank
176 within said tank holding zone, said
177 interengagement means being operative to rotate
178 said first driveshaft means clockwise and said
179 second driveshaft means counterclockwise
180 simultaneously to move said first clamping means
181 and said second clamping means toward the opened
182 position for releasing of a tank from within said
183 tank holding zone.